



**NORTH DAKOTA  
DEPARTMENT OF HEALTH**

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IN THE MATTER OF:

Proposed Determination of the Adequacy of the North Dakota State Implementation  
Plan to Prevent Significant Deterioration.

It is ordered that the recommended findings of fact and conclusions of law of the  
hearing officer are adopted as the Department's findings of fact and conclusions of law  
in this matter.

Dated at Bismarck, North Dakota this 8<sup>th</sup> day of September, 2003.

North Dakota Department of Health  
State Health Officer

A handwritten signature in cursive script, appearing to read "Terry L. Dwelle".

Terry L. Dwelle, MD, MPHTM



NORTH DAKOTA DEPARTMENT OF HEALTH  
Environmental Health Section

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August 26, 2003

Terry L. Dwelle, M.D.  
State Health Officer  
ND Department of Health  
600 East Boulevard Avenue  
Bismarck, ND 58505-0200

Dear Dr. Dwelle:

Enclosed are the recommended Findings and Conclusions for the public hearing on the Adequacy of the Proposed Determination of the North Dakota State Implementation Plan to Prevent Significant Deterioration of Air Quality. A public hearing was conducted on June 12-13, 2003 in Bismarck, North Dakota. Written comments were accepted through July 1, 2003. My findings indicate that North Dakota continues to have excellent air quality, where the State Implementation Plan continues to protect the applicable increments. I would like to thank Doug Bahr, Attorney General's Office for his participation as hearing officer and for his document review comments.

If you should have any questions regarding this matter, please feel free to contact me at 8-5152.

Sincerely,

L. David Glatt, Chief  
Environmental Health Section

LDG:cc

Enc.

cc: Doug Bahr, Attorney General's Office


State of North Dakota  
Before the North Dakota Department of Health  
Environmental Health Section, Air Quality Division

In the Matter of:

**Proposed Determination of the Adequacy of the North Dakota State Implementation Plan to Prevent Significant Deterioration.**

Pursuant to the directive of state health officer Terry Dwelle, MD, dated June 3, 2003.

Dated at Bismarck, North Dakota, this 24 day of August, 2003.

  
L. David Glatt, Hearing Officer

The North Dakota Department of Health (Department) having given notice of a hearing seeking additional comment and testimony concerning a Proposed Determination of the Adequacy of the North Dakota State Implementation Plan (SIP) to Prevent Significant Deterioration of air quality in North Dakota pursuant to 40 CFR § 51.166, and to make a final determination of the adequacy of North Dakota's SIP and whether the Prevention of Significant Deterioration (PSD) Class I increments are being violated; and

The state health officer, Terry Dwelle, MD, having appointed a hearing officer to conduct the public hearing and to make recommended findings to him regarding the adequacy of the SIP to prevent significant deterioration of air quality and whether the PSD increments are being violated, as well as issues identified in his findings made in proceedings on August 8, 2002; and

The notice of hearing having solicited comments on specific issues relating to the proposed determination by the Department; and

The public hearing having been conducted at the Pioneer Room, State Capitol, Bismarck, North Dakota on June 12 and 13, 2003; and

The record of the hearing having remained open for written comments on the proposed determination and issues through July 1, 2003, with written documents having been submitted into the record; and

The Hearing Officer having heard testimony and reviewed written comments on: 1) monitoring data and air quality trends in Class I areas; 2) identification and adequacy of the modeling protocols and determinations performed by the Department, Basin Electric Power Cooperative (Basin) and the U.S. Environmental Protection Agency (EPA); 3) suggested meteorological modeling inputs; 4) the definition for and determination of baseline concentrations and the Department's Maximum Allowable Ambient Level (MAAL) modeling

approach; 5) definition and determination of normal source operation and determination of baseline emissions; 6) current emissions; 7) variance sources and alternative PSD Class I increments; and, 8) interpretation of the Clean Air Act and supporting documentation relating to the Department's discretion in the management, enforcement and evaluation of the PSD Class I increments in North Dakota.

The hearing officer having considered the comments, testimony, and exhibits made at the hearing and submitted into the record, makes the following

### **Findings and Conclusions.**

#### **Jurisdiction**

- 1.0 The June 12 and 13, 2003, hearing was a continuation of the hearing conducted by the Department on May 6-8, 2002, to determine the adequacy of the North Dakota SIP to prevent significant deterioration of air quality in North Dakota. 40 CFR § 51.166 requires the Department to review the adequacy of the SIP on a periodic basis and within 60 days of such time as information becomes available that an applicable PSD increment is being violated. The hearing followed the procedures required by 40 CFR § 51.102 and the North Dakota SIP. N.D.C.C. § 23-25-03(9) provides that the Department shall "[h]old hearings relating to any aspect or matter in the administration of [N.D.C.C. ch. 23-25]," and this hearing was conducted pursuant to the Department's general authority to conduct investigative hearings under that chapter. N.D.C.C. § 23-01-23.

#### **Previous Findings and Conclusions**

- 2.0 Based on the additional comments and testimony received, the findings and conclusions made by the State Health Officer on August 8, 2002, are not changed or modified except as specifically stated in these findings and conclusions. The following additional findings and conclusions pertain to the issues noticed for public hearing in the Notice for Hearing and new information provided to the hearing record for these proceedings.

#### **Use of Monitoring Data**

- 3.0 The Department has maintained and operated ambient air quality monitoring stations in PSD Class I areas of the state for up to and over 20 years. The sulfur dioxide data collected from the monitoring stations located in the Lostwood National Wildlife Refuge and Theodore Roosevelt National Park (TRNP), North and South Units, are reliable quality controlled and quality assured data.
- 3.1 The measured data suggests that ambient sulfur dioxide concentrations in the Class I areas have been decreasing or have been stable since the early 1980's. Measured sulfur dioxide levels in the TRNP North unit have declined from 24 hour second highs of more than 90 ug/m3 (micrograms per cubic meter) in 1982 to 8 ug/m3 in 2002. Measured SO2

levels in the TRNP South unit have remained stable at approximately 8 ug/m<sup>3</sup> from 1980 to 2002.

- 3.2 Emissions of sulfur dioxide from all sources in North Dakota have declined from a total of 220,795 tons during 1993 to 161,584 tons during 2002.
- 3.3 In connection with PSD permits issued for projects in 1982, 1984 and 1993, the Federal Land Managers (FLMs) found no adverse impact on Air Quality Related Values (AQRVs) in Class I areas resulting from sulfur dioxide emissions. In 1993, FLMs also found that air quality in North Dakota appeared to have improved since their earlier 1984 determination of no adverse impacts on AQRVs. These findings support the trends suggested by the Department and National Park Service's monitoring data.
- 3.4 No new information that would challenge or alter previous FLM certifications of no adverse impact for North Dakota's PSD Class I areas was provided during the hearing. Data from the National Park Service suggests that sulfate ion concentrations and deposition in the TRNP have decreased over the past decade.
- 3.5 Monitoring data are the standard and measure by which modeling results are to be judged and held to "ground truth." The monitoring data are the best evidence for determining the accuracy and performance of the model protocols that have been submitted for review.
- 3.6 The monitoring data from the Department and National Park Service, in addition to the determinations of no adverse impact from the FLM support the conclusion that there has been no significant deterioration of air quality relating to sulfur dioxide concentrations in the Lostwood National Wildlife Refuge and TRNP, North or South units and no violation of the PSD Class I 24-hour sulfur dioxide increments.

#### **Use of Calpuff Air Quality Model**

- 4.0 The Calpuff air quality model was used by the Department, the EPA, and Basin to complete air quality modeling assessments to estimate ambient concentrations of sulfur dioxide in the respective PSD Class I areas in North Dakota.
- 4.1 The Department solicited comments on the use of the Calpuff model for predicting ambient sulfur dioxide concentrations in PSD Class I areas, for visibility impact analyses, and for its use as a non-guideline model to assist in making the final determination of the adequacy of the SIP in these proceedings. The Department did not receive any objections to using the Calpuff model for these purposes.
- 4.2 The EPA has noticed the Calpuff model as a guideline air quality model in the federal register.

- 4.3 Monitored background concentrations of sulfur dioxide are unknown; they are less than 1 part per billion (which is equivalent to 2.6 micrograms per cubic meter), which is the lowest sulfur dioxide concentration that Department monitors detect in the ambient air. Establishing a background concentration is important to model performance assessments. Calpuff allows assessment of background concentrations through evaluation of modeling and monitoring data. See, e.g., "Comparison of Calpuff Results With and Without ENSR RUC/MM5 Data for Year 2000" submitted by the Department and model performance evaluations submitted by Basin.
- 4.4 The Calpuff model<sup>1</sup> is approved to assist in making air quality assessments in these proceedings, and, additionally, it may be used in any permit application made to the Department until its final adoption in North Dakota rule, provided proper public notice is given under N.D. Admin. Code § 33-15-15-01(4)(2), for the following reasons:
- (1) Calpuff allows improved estimations of ambient concentrations consistent with the holding that Congress expected EPA and the states "to develop and utilize the most accurate and feasible modeling techniques available." Alabama Power v. Costle, 636 F.2d 323, 387 (D.C. Cir. 1980).
  - (2) Calpuff allows the use of different and more complete meteorological data such as RUC2/MM5 data. This will allow the Department to evaluate whether to develop and use modeling techniques that use RUC2/MM5 data.
  - (3) Calpuff allows use of meteorological data corresponding to the current period of actual emissions, which allows apples-to-apples comparisons of estimated concentrations with ambient monitoring data from that time period to measure model performance and accuracy.
- 4.5 The Department should amend air quality rule N.D. Admin. Code § 33-15-15-01(4)(1) to incorporate the Calpuff model and to approve its use as a guideline model in periodic review proceedings after EPA finalizes its final adoption of Calpuff, subject to the requirements of N.D.C.C. ch. 28-32 and N.D.C.C. § 23-01-04.1.

### Use of Meteorological Data

- 5.0 Congress intended that EPA and the states "develop and utilize the most accurate and feasible modeling techniques available." Alabama Power, 636 F.2d at 387. Evidence presented at the hearing indicate that there are different MM data sets available that are compatible with the Calmet meteorological model. One of these data sets is the rapid uptake cycle (RUC/MM5) data set used by Basin in its modeling assessments in these proceedings. Expert testimony presented at the hearing indicated that the RUC2/MM5 advanced meteorological data and prognostic mesoscale model were superior to traditional

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<sup>1</sup> The air quality models referenced in N.D. Admin. Code § 33-15-15-01(4)(f) are approved for new major source and major modification review. N.D. Admin. Code § 33-15-15-01(4). EPA, and the Department, have not adopted rules for models to be used for periodic review proceedings.

surface and balloon data. See, e.g., testimony of Walter H. Lyons, Ph.D., and Professor Leon F. Osborne, Jr., M.A.

- 5.1 EPA's proposed amendments to Appendix W of its PSD rules in its recent federal register notice allows the use of three years of MM data, such as RUC2/MM5 data, as a substitute for the traditional five years of data that have been used.
- 5.2 EPA conducted sensitivity comparisons of Calpuff differences resulting from the use of traditional surface and balloon data and RUC2/MM5 data. Its conclusions were that there was no significant difference in the modeling results. However, expert testimony provided by Basin, as well as results comparisons by the Department, demonstrated via more comprehensive analyses that use of RUC/MM5 provides better agreement between modeling results and monitoring data.
- 5.3 EPA had expressed concern that the RUC2/MM5 data would not be universally available for public use. Basin testimony established that the RUC2 data has been made available to the public for any of the purposes being evaluated as part of this hearing.
- 5.4 Use of RUC/MM5 data is approved for the limited purpose of model performance evaluations and as one of the ways, but not the only way, for determining compliance with the SIP and the PSD increments, provided that at least three years of RUC/MM5 data are used. The Department should continue to assess and review use of RUC/MM5 data for other modeling applications.

#### Use of Emission Inventories

- 6.0 Testimony and written comment included the methods used to evaluate and determine emission inventories. Accurate site specific emission inventories improve dispersion model estimates of the actual impacts on air quality. Issues reviewed and considered include: 1) normal source operations, and 2) EPA AP-42 and site specific emission factors.
- 6.1 The Department, under its EPA approved SIP, is the reviewing authority designated to make the normal source operation determination. Alternate normal source operation dates after the baseline date may be identified if the alternate date is more representative of the normal source operations. The flexibility provided to the Department is identified in 45 Fed Reg. 52675, 52714 (August 7, 1980) which states:

An actual emissions policy, however, does allow air quality impacts due to production rate increases to sometimes be considered as part of the baseline concentration. If a source can demonstrate that its operation after the baseline date *is more representative of normal source operation* than its operation preceding the baseline date, *the definition of actual emissions* (i.e., 40 C.F.R. § 51.24(b)(21); N.D. Admin. Code § 33-15-15-01(1)(a)) allows *the reviewing authority* to use the more representative period to

calculate the source's actual emissions contribution to the baseline concentration. EPA thus believes that sufficient flexibility exists within the definition of actual emissions to allow any reasonably anticipated increases or decreases genuinely reflecting normal source operation to be included in the baseline concentration.

(Italics provided)

- 6.1.1 In comments regarding normal operations for the Leland Olds Station (LOS), EPA cites a May 3, 1976, letter from Basin to the Department indicating that Unit 2 had recently operated consistently at or near the nameplate load of 440 megawatts. The May 3, 1976, letter stated that "the plant had only recently (emphasis added) operated at nameplate capacity". EPA utilized this information to calculate emissions based on 1976-77 activities data. However, EPA appeared to disregard a May 26, 1976, letter from Basin to the Department which indicated further problems had developed with the unit. One or two months of operation at nameplate capacity does not represent "normal operations" for a two-year period.
- 6.1.2 Pursuant to the authority provided in rule and the documentation provided during the hearing, a period other than a 1976-77 baseline date may be used for the baseline period when it is shown to be more representative of normal operations for a facility. Based upon information regarding the operation of most major sources, the Department identified an alternate normal source operating period after the baseline date for some sources. Justification and support for this position was provided in the hearing record.
- 6.2 The Department has revised the standard EPA AP-42 factors utilizing site specific continuous emission monitoring, operational and coal quality data. The Department believes that standard AP-42 factors should only be used when no other valid site specific data is available for calculating emissions. The Department supports this position by noting that EPA's "Introduction" to AP-42 makes the following statements:

Use of these factors as source-specific limits and/or as emission regulation compliance determinations is not recommended by EPA.

Data from source-specific emissions tests or continuous emissions monitors are usually preferred for estimating a source's emissions because those data provide the best representation of the tested source's emissions.

Average emissions differ significantly from source-to-source and, therefore, emission factors frequently may not provide adequate estimates of the average emissions for a specific source. The extent of between-source variability that exists, even among similar individual sources, can be large depending on process, control system, and pollutant.

To assess with-in source variability and the range of short-term emissions from a source, one needs either a number of tests performed over an

extended period of time or continuous monitoring data from an individual source.

- 6.2.1 AP-42 makes it clear that its factors may not be accurate for individual sources. The Department has calculated site specific emission factors for each existing baseline source based on CEM data. That analysis, which is part of the Department's baseline emission rate analysis, indicates that a higher emission factor than 30(S) is warranted for Leland Olds Station Units 1 and 2, Minnkota Unit 1, and Stanton Station Unit 1. A lower emission factor is warranted for Heskett Station Units 1 and 2. This conclusion is supported by the document "Some Studies on Stack Emissions for Lignite Fired Power Plant" which is the primary basis for the AP-42 emission factor 30(S) for lignite combustion.

### **Whether the PSD Increment Is Being Violated**

- 7.0 In 1999, the Department provided EPA with a draft New Source Review (NSR) analysis pertaining to a major modification at a coal-fired electricity generating plant in the state. Two observations of the model predicted results of that draft analysis triggered North Dakota's comprehensive review of historical use of models summarized in section 7.1 of these findings. First, the results overstated possible PSD Class I increment consumption because emissions of oil and gas production wells operating at PSD baseline were not included although emissions of such wells operating in current time were included. Second, the results indicated deterioration in sulfur concentrations of similar magnitude as recently measured concentrations in TRNP, which is unreal and due, in part, to use of allowable, rather than actual emissions, of major sources.
- 7.1 The hearing record contains the proposed EPA model, model inputs and model results as it relates to the evaluation of the adequacy of North Dakota SIP to prevent significant deterioration of sulfur dioxide in North Dakota's PSD Class I areas. EPA's determination that the increment is being violated is rejected for the following reasons:

7.1.1 **EPA's Failure to Measure Increment Consumption Over the Baseline Concentration.**

The Court noted in Alabama Power that "the starting point for determining the baseline in a particular clean air region is the existing ambient pollution level in that area at the time of the first application for a permit by a major emitting facility" [footnotes omitted.] 636 F.2d at 374. The existing ambient pollution is due to existing actual emissions rather than permit allowable emissions.

Congress did not define the increments for sulfur dioxide standing alone, but rather defined them as "the maximum allowable increase in concentrations ... *over the baseline concentration* ..." 42 U.S.C. § 7473(b)(1). (Italics provided.)

Congress defined "baseline concentration" as "*the ambient concentration levels* which exist at the time of the first application for a permit in an area subject to this part, based on air quality data available in the Environmental Protection Agency or a State air pollution control agency and on such monitoring data as the permit applicant is required to submit." 42 U.S.C. § 7479(4). (Italics provided.)

EPA's approach for determining air quality deterioration and PSD increment consumption does not determine the baseline concentration or the ambient concentration level for each short term increment. Instead, the baseline source inventory are subtracted from the current source inventory, and the differences are modeled. The results are then compared to the Class I increments. This was the approach that EPA initially proposed in its 1978 regulations, in which no "baseline concentration" was "formally established." 43 Fed. Reg. 26380, 26400 (June 19, 1978). This approach, however, was rejected in Alabama Power. Rather, Alabama Power determined that Congress expected EPA and the states "to develop and utilize the most accurate and feasible modeling techniques available," 636 F.2d at 387, and "to use actual air quality data to establish the baseline" which is defined "in terms of existing ambient concentration levels" on the minor source baseline date. *Id.* at 372. In addition, "Congress intended that monitoring would impose a certain discipline on the use of modeling techniques," through "the development of sophisticated monitoring techniques" by which modeling techniques would be "held to earth by a continual process of confirmation and reassessment, a process that enhances confidence in modeling, as a means for realistic projection of air quality." *Id.* at 372.

The Department has employed an alternative approach for baseline concentration and increment consumption in its proceedings that is consistent with 42 U.S.C. § 7479(4), the language of Alabama Power relating to modeling and monitoring, and the rules and manual EPA adopted immediately after Alabama Power was decided. These rules redefined how the "baseline concentration" was to be established by the state. 45 Red. Reg. at 52714-715. It also describes how "Increment Consumption" is to be determined through "Use of Actual Emissions." *Id.* at 52717-719. The manual EPA finalized at that time demonstrates in more detail how this process works. In establishing the emissions inventories, the manual provides:

At a minimum, the data should be presented in a summary format showing highest and highest, second highest concentrations for pollutants with short-term standards and the appropriate long-term average associated with each standard. *These concentrations effectively describe the existing ambient concentrations within the impact area attributable to actual emissions from existing sources.*

In many cases, monitoring data may require adjustment to compensate for new emissions permitted in the impact area but not occurring during the monitoring period. The emissions inventory used for adjusting the monitoring data should be gathered as previously described and should be used to adjust the monitoring data by proper dispersion modeling

procedures. EPA *Prevention of Significant Deterioration Workshop Manual I* at I-C-23 (October 1980).

How these short-term baseline concentrations are used to determine whether there is an increment violation is illustrated in Table C-4 of the manual, in which the short-term "total possible air quality" is the highest or maximum ambient concentration allowed after the increment is added to the "existing air quality" or baseline concentration to determine whether the maximum allowable ambient concentration is exceeded (i.e., the short-term 3-hour or 24-hour "baseline concentration" plus the relevant 3-hour or 24-hour increment). *Id.* at I-C-34.<sup>2</sup>

The Department's approach follows the provisions of 42 U.S.C. § 7479(4), *Alabama Power*, 636 F.2d at 372, 387, and the 1980 *Prevention of Significant Deterioration Workshop Manual*. It involves determining the 3-hour and 24-hour baseline concentration for the Class I area by modeling emissions from all the sources that operated during the baseline at normal operation, adding the PSD allowable increment (i.e., 25 mg/m<sup>3</sup> for the 3-hour and 5 mg/m<sup>3</sup> for the 24-hour average) to the baseline concentration to establish an exceedence threshold known as the Maximum Allowable Ambient Level (MAAL). Once the MAAL is established, the current source emissions are modeled to determine the current concentration for each 3-hour and 24-hour period for the year. The current concentration is then compared to the MAAL to determine if any exceedences of this threshold occur. One exceedence of the threshold is allowed. A second exceedence would constitute a violation.

EPA's modeling of increment consuming emissions only does not measure the increment consumption over the baseline concentration, and, thus, EPA never measures whether the actual short term conditions are improving or declining. In sum, EPA's approach fails to determine "the maximum allowable increase in concentrations ... over the baseline concentration ...", as required by 42 U.S.C. § 7473(b)(1). Instead, it merely looks at increment consumption standing alone, which, for the reasons discussed above, does not allow any determination whether short-term air quality is actually improving or declining.

In sum, the baseline concentration must be determined to appropriately evaluate PSD increment consumption.

#### **7.1.2 EPA's Failure to Use the Normal Source Operation Emission Inventory Determined by Department as Reviewing Authority.**

Under its EPA-approved SIP, the Department is "the reviewing authority" that makes the normal source operations determination. There is no provision in rule or statute for the EPA to make its own independent "normal source operation" determination. "We rule

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<sup>2</sup> EPA's 1990 *New Source Review Manual* (draft October 1990) has never been finalized like the 1980 manual, and, further, its approach is inconsistent with both the language of *Alabama Power* cited above and the definition of "baseline concentration" at 42 U.S.C. 7479(4), which measures deterioration of air quality from "ambient concentration levels" as established in a manner described in the quoted language above from the 1980 *Prevention of Significant Deterioration Workshop Manual*.

that EPA has authority under the statute to prevent or to correct a violation of the increments, but the agency is without authority to dictate to the States their policy for management of the consumption of allowable increments." Alabama Power, 636 F.2d at 361.

Refer to section 6.1 of these findings for additional justification for the determination of normal source operation by the Department.

### **7.1.3 EPA's Failure to Use "Actual Emissions" as Defined by Rule in Calculating Increment Consumption.**

In NSR-PSD proceedings, the Department historically used "allowable" emissions, rather than "actual" emissions, to determine increment consumption. In the preamble to the rules, in which EPA adopted its current "actual emissions policy," 45 Fed Reg. at 52714, EPA recognized that "if increment calculations were based on allowable emissions, EPA believes increment violations would be inappropriately predicted and proposed source construction would be delayed or halted." 45 Fed Reg. at 52718.

The federal and state rule definitions of "actual emissions" are identical, 40 C.F.R. § 52.21(b)(21); N.D. Admin. Code § 33-15-15-01(1)(a), and North Dakota has adopted the WEPCO amendment to this definition.<sup>3</sup> The 1980 preamble to the rules describes how the definition of "actual emissions" is to be applied:

"Under the final PSD regulations, the phrase 'actual emissions' means the rate at which an emissions unit actually emits a particular pollutant. See §§ 51.24(b)(21) and 52.21(b)(21). In general, that rate as of a particular date equals the average rate in tons per year at which the unit actually emitted the pollutant during the two year period which precedes the particular date and is representative of normal source operation. The reviewing authority may presume that any 'source-specific allowable emissions' for the unit is equivalent to the actual emissions of the unit. For any unit that has yet to begin normal operations on the date in question, its actual emissions equal its 'potential to emit' on that date."

45 Fed Reg. at 52699.

The "in general" language is qualified by the next two sentences of the rule definition. It does not provide a reason to justify a rate other than the average rate in tons per year, modified by operating hours, for short-term emissions.

In sum, the rule gives two options with regard to "actual emissions" from a power plant: (1) to presume that any source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit; or (2) to determine the rate in tons per year at which the unit actually emitted the pollutant during the two year period which precedes the particular date, provided it is representative of normal source operation. Historically the

<sup>3</sup> See 57 Fed. Reg. 32314 (July 21, 1992).

Department chose option 1, but switched to option 2 in these proceedings, in part, because option 1 was inappropriately predicting increment violations.

The rule does not have a separate definition for "actual emissions" for determining short-term (i.e., 3-hour and 24-hour) sulfur dioxide increment consumption. EPA's ad hoc use of 90<sup>th</sup> percentile emission rates for short-term increment consumption is not supported anywhere in statute, rules or Appendix W. There is nothing in Appendix W that justifies departing from the rule definition. Thus, the use of 90<sup>th</sup> percentile emission rates is not supported by the PSD rules or Appendix W.

#### **7.1.4 EPA's Failure to Use Monitoring Data in Determining Model Performance and Air Quality Trends.**

Monitoring data shows that sulfur dioxide in North Dakota's Class I areas has significantly improved rather than declined.

The purpose of a periodic review is to determine the status of air quality compared to baseline. Monitoring plays a critical role in making this assessment. Although modeling is used as a predictive tool, actual monitoring is necessary to evaluate model performance, and to evaluate historical pollution levels and trends.

As previously noted, "Congress intended that monitoring would impose a certain discipline on the use of modeling techniques," through "the development of sophisticated monitoring techniques" by which modeling techniques would be "held to earth by a continual process of confirmation and reassessment, a process that enhances confidence in modeling, as a means for realistic projection of air quality." Alabama Power, 636 F.2d at 372.

EPA's failure to model a full, current emission inventory does not allow the comparison of modeling to monitoring intended by Congress. Such a comparison in the Department's periodic review proceeding allows the comparison Congress intended and allows the fact-finder to judge which modeling methodology most accurately predicts actual ambient concentrations.

The Department's approach of using both modeling and monitoring to determine whether air quality is deteriorating in Class I areas is within the Department's permissible discretion.

#### **7.1.5 EPA's Traditional Method for Assessing Increment Consumption does not perform the Modeling Task required by 40 CFR 51.166.**

Calpuff cannot reliably predict short-term concentrations due to emissions of multiple sources at disperse geographic locations that correspond with real data at a particular time and place such as the site of a monitor in a PSD Class I area. As a consequence, EPA's traditional method, which relies on reasonable paired-in-time agreement between model predicted and monitored concentrations, is incapable of assessing whether worst-case

concentrations in Class I areas at PSD baseline have improved or deteriorated. See, e.g., testimony of Kirk Winges.

Refer to section 7.1.1 for additional discussion on assessing PSD increment consumption.

**7.1.6 EPA's Inclusion of Sources Granted a Variance under 42 U.S.C. § 7475(d) in Calculating Consumption of the Primary Increment under 42 U.S.C. § 7473(b)(1) Rather Than the Alternative Increment under 42 U.S.C. § 7475(d).**

In completing its modeling assessment of air quality in North Dakota, EPA has contended that the PSD Class I increments apply to all sources, including those which have been granted a variance from the FLM. This is clearly inconsistent with the meaning of 42 U.S.C. § 7475(d), and its legislative history. Air Quality Related Values (AQRVs), not the PSD Class I increments, are the determinate for protecting air quality in PSD Class I areas. When a FLM has declared a no-adverse impact due to air quality that is expected to decline in amount greater than a primary increment, that primary increment no longer applies. Sources permitted under the variance procedures must be considered when conducting an AQRV analysis; however, air quality deterioration is evaluated against the alternative increments.

(1) The FLM has certified "no adverse impact" at concentrations greater than the deterioration thresholds of the primary increments.

(2) Monitoring the air quality in the Class I areas provides important data for use by FLMs when evaluating current impacts on AQRVs.

(3) Current monitoring indicates levels of sulfur dioxide to be less than or similar to levels during 1982, 1984, 1985, and 1993, when FLM's certified no adverse impacts on AQRVs.

**Implementation of Sulfur Dioxide Emission Caps**

**8.0** EPA assured the Alabama Power court that it would adopt rules or other methods of "reasonable attribution" for periodic review proceedings to determine rollbacks or other appropriate measures related to sulfur dioxide emission increases. 636 F.2d at 363-64. To date, EPA has not adopted rules or other methods for periodic review proceedings.

**8.1** A permitted facility must comply with "the applicable provisions of the state implementation plan and any other requirements under local, state, or federal law." N.D. Admin. Code § 33-15-15-01(6)(c). This includes compliance with the state and federal PSD increments.

**8.2** "We rule that EPA has authority under the statute to prevent or to correct a violation of the increments, but the agency is without authority to dictate to the States their policy for

management of the consumption of allowable increments.” Alabama Power, 636 F.2d at 361.

- 8.3 The preamble to the 1980 PSD rules EPA adopted after Alabama Power was decided indicates that if actual rather than allowable emissions are used to demonstrate compliance with the increment, they must be made federally enforceable to demonstrate continued compliance with the increment. North Dakota’s current PSD rules (N.D. Admin. Code ch. 33-15-15) have been adopted pursuant to the 1980 PSD rules.
- 8.4 Pursuant to its authority to manage the PSD increments, the Department may revise the SIP and/or issue or update operating permits so that SIP requirements and permits reflect actual source operating conditions to prevent actual emission levels which would violate the increments. N.D. Admin. Code § 33-15-15-01(6)(c).

### **Expansion of Air Quality Monitoring Network**

- 9.0 The Department has made progress in expanding its air quality monitoring network since the May-2002 hearing, and should complete as necessary the appropriate expansion of this network. This is consistent with Congress’s intent “that monitoring would impose a certain discipline on the use of modeling techniques.” Modeling techniques should be “held to earth by a continual process of confirmation and reassessment, a process that enhances confidence in modeling, as a means for realistic projection of air quality,” Alabama Power, 636 F.2d at 372. In addition, monitoring activities continue to demonstrate that air quality is not deteriorating in North Dakota’s Class I areas.

### **Continuing to Engage the EPA**

- 10.0 The evidence shows that the Department has engaged EPA since the last hearing to resolve outstanding issues through a written agreement and through continued negotiations. It should continue to do so subsequent to this order.
- 10.1 The Department should confine resolution of outstanding EPA issues to matters that do not compromise the analyses in sections 7.0 and 7.1 of these findings, such as (1) receptor based application of the MAAL approach rather than an averaged receptor-network based application of the MAAL approach and (2) coal sulfur content during the two years of baseline normal operations rather than coal sulfur content during life of mine in use at baseline.
- 10.2 Beyond the findings and the analyses in section 7.1 above, the hearing record does not identify eminent circumstances under which future deterioration of sulfur dioxide concentrations that would exceed the PSD Class I sulfur dioxide increments might occur. The Department should continue to evaluate and propose for implementation process as may be necessary to establish emission caps or other federally enforceable emission levels. The process should include action pathways for additional demonstration of no-

adverse impact and for continued protection of PSD Class I primary and alternative increments. Thereon, the SIP should be modified as may be necessary to protect against increases in sulfur dioxide emissions that may violate the applicable increments.

### **Adequacy of the SIP**

**11.0** EPA participated in the Department's hearing process, and it had the opportunity to, but did not:

(1) Adequately explain why in 2000 it changed its longstanding position of respecting FLM certifications of no adverse impact and the alternate increment when it notified the Department that sulfur dioxide emissions must be reduced to correct longstanding, modeled violations of the primary increment.

(2) Provide persuasive reasons as to why the Department should not respect the law and rules regarding "baseline concentration", "actual emissions", and the "alternative increment".

(3) Demonstrate that its use of the Calpuff model with its choices for weather and emission-rate data provides results in better agreement with the available, monitored sulfur dioxide concentrations in western North Dakota.

(4) Demonstrate that the Department was unreasonable and arbitrary in determining baseline periods of normal source operation and application of EPA's AP-42 method of calculating baseline sulfur dioxide emission rates.


**11.1** Based on the above findings and analyses, Exhibit 81, titled "May 2003 Calpuff Analysis of Current PSD Class I Increment Consumption in ND and Eastern Montana", and companion Exhibit 83, titled "May 2003 Prevention of Significant Deterioration Sulfur Dioxide Final Baseline Emission Rates with Appendices A through K", are reasonable and are adopted as the Department's finding that there presently is no PSD Class I sulfur dioxide increment violation occurring in North Dakota or Eastern Montana.

**11.2** For the reasons stated in section 7.1 above, the use of 90<sup>th</sup> percentile emissions and the failure to use the MAAL approach in the modeling performed by Basin is not accepted. However, if a reviewing court should determine as a matter of law that this finding is in error, based on section 5.4 above, I do find that the Basin increment modeling is otherwise acceptable, and, with the above caveats, shows compliance with the increments under the methodology advocated by EPA.

**11.3** Based on the above findings, triggers for additional periodic review under 40 CFR § 51.166(a) shall include a significant trend in monitored concentrations in a PSD Class I area indicating increases in sulfur dioxide and/or significant increase in sulfur dioxide emissions.

11.4 Based on the above findings and my August 8, 2002, determinations, I find that North Dakota's SIP is adequate to protect against air quality deterioration.

Dated at Bismarck, North Dakota, this 8<sup>th</sup> day of September, 2003.

  
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Terry L. Dwell, MD, MPHTM  
State Health Officer